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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

FEB 1 1988

MEMORANDUM

SUBJECT: Cherokee County Workshop, (GW/SW), January 8, 1988

FROM: Alice C. Fuerst ACF
REMD/SPFD

TO: Files

On January 8, 1987, the meeting was held to discuss the ground water/surface water operable unit feasibility study for the Cherokee County site - Galena subsite. The purpose of this meeting was to: 1) recommend to the managers a strategy for organizing the citizens in Galena to establish an entity to fund and operate the alternative water supply, and 2) to select a preferred remedial alternative for the ground water/surface water OUFS. Following this meeting, the recommended preferred alternative would be taken to upper management of KDHE and EPA. Present at the meeting were the following:

Karl Mueldener, KDHE
Larry Hess, KDHE
Larry Knoche, KDHE
David Veith, Bureau of Mines
David Sheridan, COE
Frank Bader, COE
Dick Moos, CH2M Hill
Dirk Van Zyl, CH2M Hill
Jane Kloeckner, EPA/CNSL
Elizabeth Murtagh, EPA/DRNK
Gale Wright, EPA/SPFD
Bob Morby, EPA/SPFD (attended portions of meeting)
Alice Fuerst, EPA/SPFD

Hess reviewed the plan for organizing the Galena area citizens to form a committee to determine the best method to implement the alternative water supply alternative. Rex Heape, who is with KDHE Chanute office, will be the local contact person for the work. Hess will meet with Heape during the week of January 11. Heape will obtain names of at least two people in the Lowell area and two people from the West Galena area to form a steering committee. He will use his own knowledge of the residents and information from the City of Galena to find interested people to be on the steering committee. They will plan to have the first meeting of the steering committee during the week of January 25 to talk in general about what the alternative is and what their options are for implementing the alternative. Hess discussed having a person from Farm and Home Administration, County Commission and Jim Gaskall of Soil Conservation Service at the meeting. A second meeting of the steering committee will be held about two weeks later to discuss in more detail the legal process, FHA loan procedures

and committment notices. The EPA has offered to assist as necessary. Mueldener and Wright agreed to the strategy for KDHE to proceed.

Fuerst explained that workgroup has been working on the ground water/surface water OUFS for several months. The group screened technology and response actions to develop a list of 12 remedial alternatives. Those 12 alternatives were screened and 7 were eliminated. CH2M Hill has conducted a detailed evaluation of the remaining 4 alternatives and the no-action alternative. The meeting was to discuss those remaining 5 alternatives and to select the preferred alternative.

Van Zyl discussed the surface features of the Galena subsite and the ground water/surface water flow systems. The locations of the mine area were shown. Van Zyl discussed the ground water/surface water interactions and the model for the subsite.

The metal loading modeling showed that 20 to 30 percent of the zinc and cadmium comes from the surface, while 70 to 80 percent of zinc and cadmium comes from subsurface. The metal loading modeling did not include lead because it goes in and out of solution. Based on the chat samples and professional judgment, CH2M Hill estimated that 80 percent of the lead comes from the surface waste and 20 percent from the subsurface.

	Surface Waste	Subsurface Waste	Upstream
Sulfate	15%	28%	57%
Cadmium	26%	74%	-
Zinc	24%	67%	8%

Cadmium and lead present a public health threat while zinc presents an environmental threat.

° Van Zyl discussed the details of the alternatives.

° Alternative 2

- Remove surface waste by milling and selling the concentrates.
- Backfill mines using the clean tailings and tailings from Treece. Kaolin would be mixed with the tailings.
- Surface stream diversion.
- Recontour areas.
- Administrative action.
- Remediate deep wells.
- Capital cost equals 15 million dollars.
- Time to implement the full project is 10 years, it would take 2 years to process all the surface waste.
- The purpose of the backfill is to reduce the mine voids in order to reduce the oxygen available and to reduce the permeability.

- There is an indication that additional deep borehole needing remediation may exist in the subsite. Costs for more than five wells have not been included in the cost estimates.
- Effectiveness - this action would reduce the zinc loading in the streams by 71 percent, cadmium loading by 78 percent and lead loading by 70 percent. The lead would not be reduced further because we would expect at least 15 percent of the metal to be left in the tailings.
- This alternative would not significantly change the quality of the ground water.
- One uncertainty with this alternative is that we expect 85 percent recovery of the metals during processing. This estimate is based on existing literature, although has not been pilot tested.
- Alternative 2 does not meet the ARARs for the surface water or ground water.

° Alternative 3

- This alternative is similar to Alternative 2, although does not import any chat for backfill. The clean tailings from processing of the surface waste would be used to form three ground water plugs in designated areas of the void space in the Galena subsite. The location of these plugs would be at places to reduce the quantity of water flowing through the ground.
- Capital cost equals $9,000,000. O&M costs equals $10,000 per year.
- Timeframe - two to three years to implement alternative.
- Effectiveness - Alternative 3 would reduce the cadmium loading in the streams by 67 to 81 percent, the zinc loadings from 61 to 74 percent and the lead loading by 60 to 70 percent. The range of effectiveness is based on the degree of permeabilities of the plugs. If the effectiveness of the plugs is really questionable, the efficiency would be reduced to 40 percent reduction of the zinc and 50 percent reduction of the cadmium.
- Alternative 3 does not meet ARARs in the ground water or surface water.
- The alternatives including backfilling are not for structural integrity. The cost of the alternatives would increase substantially if they were designed for special support.

° Alternative 5

- Remove surface waste and put them into an isolation unit. The isolation unit would be designed to meet minimum RCRA standards.
- Surface water diversion.
- Remediation of deep aquifer wells.
- Administrative actions.
- The isolation unit would cover approximately six acres and would be 30 feet high above ground.
- This alternative would take two to three years to implement.

- It will be difficult to remove surface waste for either isolation or treatment as in Alternative 2 or 3 due to the risk involved with moving equipment in the mined areas.
- Capital cost equals $5,000,000, $30,000 per year for O&M costs.
- Because the material to be moved will be dry, limited leachate is expected to be developed through the life of the project.
- Effectiveness - The zinc loading on the streams would be reduced 30 to 50 percent and the cadmium would be reduced by 34 to 56 percent.
- This alternative does nothing to the ground water or the subsurface contaminants.

° Alternative 10 - Treatment of Ground Water and Surface Water

- Collect and treat ground water. Ground water would be collected through extraction wells and treated at a treatment plant. If the water was treated to MCLs, it would be reinjected into the shallow ground water or it could be treated to AWQCs and discharged to Short Creek. The pumping of the ground water would change the ground water gradient so that the contaminants would be captured.
- Surface water treatment would be through wetlands.
- Remediate deep wells.
- Not much recontouring.
- Capital cost equals $10,000,000, O&M cost equals $1,000,000 per year to treat MCLs. $11,000,000 capital cost and $1,200,000 per year O&M to treat AWQC.
- Effectiveness - when treated to AWQCs the effectiveness for the removal of zinc and cadmium is approximately 80 to 90 percent. The reduction of lead is not very good because the surface waste would be left in place, approximately 10 to 15 percent.
- The timeframe for pumping would be forever.

Fuerst explained that during the workshop on January 7, the workgroup narrowed the list of alternatives to Alternatives 3 and 5. The workgroup found advantages and disadvantages to both these alternatives. Alternative 5 is the lowest cost alternative, but is not as effective as Alternative 3. Section 121 of CERCLA requires treatment options to be preferable over containment options, therefore, Alternative 3 would be preferable to Alternative 5 to meet the recommendation in the law. Because pilot testing of the removal of the metals have not been conducted, the removal efficiency is questionable in Alternative 3 and the efficiency of the plugs in the void space is also questionable. The knowledge of the efficiency of Alternative 5 is much more reliable. In either case, ARARs are not met in ground water or the surface water.

Mueldener discussed a need for a state variance if the ARARs are not met. The EPA questioned whether or not a variance was actually necessary because EPA is not taking any action to cause a problem. The Agency will be cleaning up what has been left there in the past. The EPA will not be a operator; and when EPA has completed the action, the operations will be turned over to the state.

There was much discussion among the participants of the meeting on the alternatives and on the pros and cons of all five of the alternatives. Some of the discussions include the following:

- No Action is not sufficient for the site.
- Alternative 5 does nothing with the ground water, while Alternative 3 at least tries to improve the ground water quality.
- Alternative 10 would continue forever, while there will be a completion of the other alternatives. The yearly O&M for Alternative 10 would be paid by the state.
- There was discussion on public acceptance of the containment unit onsite.
- There was discussion on conducting Alternative 3, but with no plugging. This would be as effective as Alternative 5 and would include the treatment as recommended by CERCLA. The cost of this would be approximately six million dollars. There was also discussion of what to do with the clean tailings, whether to leave them in the surface impoundment or slurry them underground without clay.
- CH2M Hill suggested that at least $500,000 were needed for pilot and bench testing of Alternative 3 prior to design.
- Wright suggested that EPA prepare a proposed plan for Alternative 3 and then discuss it with EPA's upper management and KDHE's upper management. The EPA would like both EPA and KDHE to agree on a proposed plan prior to the public comment on any alternative.

cc: Administrative Record (3 copies)